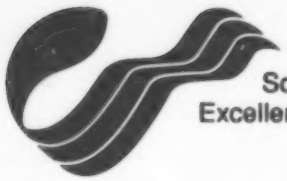

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A Review of the U.S. Farm-Raised Catfish Industry and its Implications for Canadian Groundfish Exporters

Economic and Commercial Analysis
Report No. 52

Fisheries and Oceans Pêches et Océans

Canada

A Review of the U.S. Farm-Raised Catfish Industry and its Implications for Canadian Groundfish Exporters

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ABSTRACT

This review of the U.S. catfish industry was commissioned by the Department of Fisheries and Oceans to determine market implications for Canadian groundfish exporters. Conclusions are that farm-raised catfish represents a formidable competitor to groundfish in many areas of the United States.

RÉSUMÉ

Cette revue de l'industrie de la barbue aux États-Unis a été commandée par le ministère des Pêches et des Océans afin de déterminer les répercussions, sur le marché, pour les exportateurs canadiens de poisson de fond. Les conclusions sont que la barbue d'élevage fait une forte concurrence au poisson de fond dans plusieurs régions des États-Unis.

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DISCLAIMER

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the Department of Fisheries and Oceans, and
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its Board of Directors.

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1.0 INTRODUCTION

1.1 Purpose of Study

According to the 1990 Aquaculture Situation and Outlook Report published by the U.S. Department of Agriculture, this decade should be an important one for farm-raised fish and seafood. Demographic indications point to an increase in population size in general, with major growth in the number of older Americans and ethnic groups. With the health benefits of seafood already established, USDA predicts that the monitored conditions of aquaculture combined with better culturing technology will create growth in the aquaculture sector in this decade.

Farm-raised catfish has always been a showcase for the aquaculture industry in the United States. Centred in the Delta region of Northwest Mississippi, the industry has been growing steadily during the 1980s, processing 342 million pounds of catfish in 1989, a figure which makes it a formidable competitor to cod. Catfish has, however, been largely ignored by the capture-fishery sector, even though in 1989 catfish held the number five spot on the National Fisheries Institute's top-ten list of most consumed fish in the United States -- only two places behind groundfish and up two spots from its number seven place on NFI's 1988 list.[1]

There are several reasons why catfish has escaped the notice of groundfish producers, both in Canada and in the United States. For one thing, catfish marketers have deliberately positioned themselves away from marine products. Instead, they have placed themselves in competition with beef, pork, and poultry where nutritional values and, in some cases, price have given them marketing advantages. For another, groundfish producers have concentrated on competition coming from other segments of the capture fishery. Thus, they have focused on Pacific cod, Alaska pollock, and New Zealand hoki, when in fact, catfish is present in the market in larger volumes than any of these.

This study was undertaken in an effort to acquaint Canadian groundfish exporters with the catfish industry in order to increase awareness of one of the major competitors to cod in the U.S. market. As a vertically integrated and marketing oriented farm-raised product, catfish has the supply potential to go head-to-head with cod and other groundfish. Its relatively stable price, year-round availability, and guarantees of freshness and safety have converted large numbers of American consumers from Florida to California. The fact that catfish has not yet achieved

significant market penetration in the Northeast has insulated Canadian groundfish exporters from the inroads it has made in other parts of the country.

1.2 Scope of Study

This study sought to consolidate all information currently available on the catfish industry (see Bibliography) in order to assess the implications of catfish competition in U.S. markets for Canadian groundfish exporters. The study presents a historical review of the Mississippi catfish industry. The author lived in Louisiana for some 13 years, and has researched and written several articles on the industry for leading international seafood trade publications.

Beginning with an overview of the industry, the study takes the reader through the components of the industry -- the vertically integrated nature of the business, the production process, inspection systems, marketing and promotions, sales and distribution -- in order to produce a complete picture of how catfish has achieved success and why its success is likely to continue. A lengthy section entitled "Implications for Canadian Groundfish Exporters" outlines such conclusions as can be reached from examining the catfish competition.

The task of this writer has been to take the information researched and come to some conclusions regarding the effect of catfish in the marketplace on exports of Canadian groundfish. These implications are necessarily open-ended; any Canadian groundfish exporter reading through this report should be able to examine his own business in light of an increased awareness of farm-raised catfish, and come to additional conclusions on his own.

2.0 BACKGROUND OF THE FARM-RAISED CATFISH INDUSTRY

2.1 Nomenclature

There are catfish and there are catfish. In Atlantic Canada, "catfish" refers most often to ocean catfish which is another name for wolffish (*Anarhichas lupus*). Ocean catfish is a fine, firm white-fleshed fish from the North Atlantic, landed as a by-catch of trawlers. Ocean catfish is, however, a species entirely unrelated to the catfish of this report: *Ictalurus punctatus* or channel catfish.

Channel catfish is a freshwater species, occurring naturally in the waters of many countries. In its wild state, it is a bottom feeder and scavenger, taking on the taste and texture of whatever it eats. In the southern United States, wild catfish are harvested and sold commercially into a limited market that demands a strong-tasting fish. It is the farm-raised, aquacultured version of this fish, however, that has catapulted catfish to the number five spot on NFI's list of the top ten most-consumed fish in the United States.

2.2 Overview of the Industry

The farm-raised catfish industry in the United States is still a very young industry. It had its early beginnings in the mid-'60s in Arkansas and Alabama, but production quickly spread to Mississippi. Mississippi proved a hospitable environment to the growing catfish industry, and many factors made that state an ideal place for the industry to thrive: the warm climate (which allows a 52-week a year harvest), the heavy clay soils which hold water well, the abundant water supplies coming from aquifers close to the surface, the flat land ideally suited to pond construction, the large farms able to afford the heavy investment required to enter the business, and a ready source of unskilled and inexpensive labour. There are also hatcheries, feed mills, and processing plants in the area--all necessary components of a successful, vertically integrated industry.

Despite the fact that many of the plants in Mississippi were constructed with the help of community development government grants urged on by county and municipal governments eyeing new jobs to decrease high rural unemployment levels, virtually all of the plants are highly automated. There is little discernable resentment surrounding automation;[2] everyone seems to understand that the more catfish there is to be processed, the more jobs are available. A lot of the finishing work on catfish is done by hand, and special cuts are rarely sent through the machine. So the hand-cutting lines are always busy and the work is steady.

Mississippi produces more than 85 per cent of the total U.S. farmed catfish supply, followed by Arkansas, Alabama, and Louisiana. Mississippi catfish farming is centred in the Delta (a fertile region in the Northwest sector of the state) which contains more than 95 per cent of the state's total acreage. There are approximately 90,000 acres of catfish ponds in Mississippi,

containing 116 billion gallons of fresh water from underground wells. Some 624,209,000 farm-raised catfish occupy those ponds. Most ponds are 15 to 20 land acres in size with a depth of 4 to 5 feet. Levees make up about 15 per cent of the land acres devoted to catfish farming.[3]

Wells in the Mississippi production area are about 100 to 150 feet deep and usually produce 3,000 gallons per minute. Water quality is very good, with a temperature around 65 degrees Fahrenheit from the wells. The best growth of catfish is achieved at 80 to 85 degrees Fahrenheit. During the year, the feeding season in Mississippi is from April through October; very little feed is used from November to March. Catfish eat sparingly when the temperature falls below 60 degrees Fahrenheit.

Average production per acre is about 4,000 pounds per year. Production rates have increased over time as farmers apply better technology and have increased their knowledge based on experience.

Catfish farming is expensive and the capital investment required to enter is very large. Land cost is in the $750 per acre range, and it takes $1,100 per acre to construct ponds and put in water wells. Altogether, fixed costs run around $1,850 per acre. Average operating capital required to produce one acre of catfish is about $2,400, bringing the total fixed plus operating investment to about $4,250 per acre. Catfish farming is also a high-risk business with water quality, disease, parasites, oxygen depletion, winter kill, and other factors requiring constant management attention.[4]

Despite the expense and uncertainty, however, growth in the farm-raised catfish industry over the past 20 years has been staggering. In 1970, 5.7 million pounds were produced, against the 342 million pounds produced in 1989 (see Table 1 and Appendix C). In 1970, farmers were paid 34 cents per pound for their harvest; by early 1990, that price had risen to 80 cents (see Table 3 and Appendix C). And from a cottage industry that put a few dollars in the pockets of a couple of farmers in 1970, has sprung a multi-billion dollar industry that supports 33 companies, and employs more that 6,000 people on an annual payroll in excess of $76 million.[5]

Although Mississippi pioneered the technology necessary for the development of the industry, other states are now getting into the action. Louisiana and Arkansas, in particular, have large tracts of land suitable for catfish farming, and the industry is developing in both states. In fact, any soybean-producing area could probably be utilized for catfish. (Louisiana, for example,

could put 200,000 acres into catfish production within two years if demand continues to escalate.) Because of phenomenal growth over the last ten years, supply has frequently been an issue, especially during the first quarter when sales are heaviest. Several Mississippi companies have set up or bought into farming and basic processing operations in north Louisiana and southern Arkansas simply to have access to supply.[6]

2.3 Catfish Companies

In 1986, there were 19 processors of farm-raised catfish in the United States that reported their monthly production to the U.S. Department of Agriculture.[7] (Because catfish is farmed, all reporting activities are carried out by USDA which also tracks trout, salmon, hybrid striped bass, and tilapia; the capture-fishery sector is monitored by the National Marine Fisheries Service, a division of the U.S. Department of Commerce.) Of the 19 catfish processors reporting to USDA, four were major processors, a category reserved for those who process more than 500,000 live pounds per week. By 1989, there were 33 catfish processors, most with modern processing equipment and capacities that some industry observers feel is beyond current needs. There are still four major processors, although the fourth largest company is not located in Mississippi.

The plants come in all sizes and types of ownership; most are located in the Mississippi Delta region, in the towns of Indianola, Isola, Itta Bena, and Hollandale. The largest processor is Delta Pride of Indianola, Mississippi. A four-plant operation, Delta Pride is a co-operative owned by 180 farmers. Delta Pride began processing in April, 1981, and today they sell approximately $150 million of product annually. Delta employs more than 2,000 people, and processes more than 3 million live pounds per week, with a total capacity of 4.5 million pounds. Delta's major plant is the largest fresh-fish plant of any type in the U.S. with a weekly capacity of 2 million live pounds based on a one-shift, five-day week.

Delta Pride Catfish is owned entirely by catfish farmers who sign a marketing agreement pledging their production to be marketed through the company. Delta Pride's 180 stockholders own 60,000 acres of catfish, representing more than 60 per cent of all foodfish ponds in Mississippi. If Delta Pride cannot or does not market all the output of its stockholders, they are free to sell to other processors.[8]

The second and third ranking plants, Country Skillet Catfish and Farm Fresh Catfish, are both wholly owned subsidiaries of agribusiness giants ConAgra and Geo. A. Hormel, respectively. ConAgra and Hormel are both better known for poultry, beef, and pork products than for seafood, although ConAgra is also the parent company of several other seafood operations, including Singleton Seafood and O'Donnell-Usen Fisheries Corporation. Since both companies are corporately owned, neither releases information on annual sales or processing capacity; however, it is generally well known that between them, Delta Pride and Country Skillet own 60 per cent of the market. Up until just a few years ago, neither Farm Fresh nor Country Skillet owned any acreage to speak of; supply was long, and both companies felt they could operate more efficiently by buying on the spot market.

That situation no longer exists. Country Skillet has acquired a farmer-owned processing plant which gives them access to supply, and Farm Fresh has also been buying into farms chiefly in Arkansas. Both companies are independent of their corporate cousins, however, directing all production, marketing, and distribution from their headquarters in the Delta. The fourth company, Southern Pride Catfish, is a family-owned operation located in Greensboro, Alabama. This company has shown consistent growth, but it is a much smaller company than Delta Pride, Country Skillet, or Farm Fresh. Its presence in the "Big Four" came about as a result of the acquisition by Delta Pride of the former No. 4 company, Crystal Creek Catfish.

Of the 29 remaining plants, one deserves particular mention as an example of the aggressive strategy being pursued by newcomers in the catfish game. The Aqua Group bills itself as the fastest growing organization in the catfish processing business, vying with Southern Pride for fourth place in the Big Four. The Aqua Group is one of the first catfish companies to be financed through venture capital, and its offering, together with the compelling market potential of catfish, has attracted several Canadian investors.[9] Since 1987, the Florida firm has purchased catfish plants in Mississippi, Louisiana, and Arkansas. They raided some of the best minds in the business from Delta Pride, and their strategy of diversifying into other aquacultural commodities such as shrimp, tilapia, salmon, and trout has the potential of making them a "one-stop aquacultural supplier," putting them in the position of being able to take advantage of more centralized distribution, freezing, and marketing systems.

The way the principal catfish companies are organized has, to some extent, dictated both the product they have produced and the way they have approached markets. Delta Pride, for example, a farmer-owned co-op, has concentrated heavily on commodity sales. They were among the first to develop a value-added line, but other companies have surpassed them in the number of value-added products available and the ingenuity displayed in their creation.

Corporate-owned companies like Country Skillet and Farm Fresh have pioneered the use of catfish in institutional environments like school-lunch programs and military feeding operations.[10] Farm Fresh and The Aqua Group have seen value-added items as their ticket out of the commodity bind, and both are competing for the lead as producers of value-added items; Farm Fresh alone will roll out 11 new items in 1990, while The Aqua Group showcased a line of seasoned products and two completely new foodservice items in 1989.[11]

2.4 The Catfish Market Niche

"Niche" is probably the wrong word to use to describe the extensive market penetration catfish has achieved in the last five years. Each company has pursued its own marketing strategy, but since 1986, the industry has been assisted in its marketing and promotions efforts by The Catfish Institute (TCI), established and funded by farmers and processors to promote farm-raised catfish at the consumer level. TCI's overall strategy of promoting and advertising in those areas where catfish was already known has worked extremely well with consumer advertising that has paid off with increased public awareness and acceptance of farm-raised catfish.

Farm-raised catfish is now readily available nearly everywhere in the U.S., except in the last bastions of groundfish consumers in the Northeast and Northwest. In virtually every other area of the country, however, catfish is found on the menus of white-tablecloth restaurants, in fast-food outlets, in up-scale supermarkets, and neighbourhood groceries. Catfish is not without competition, especially in coastal areas where consumers are used to eating local favourites, but it has exhibited a staying power that has enabled it to outlast most of its competitors.

3.0 PRODUCTION

3.1 A Growing Concern

The growth of the catfish industry over the past ten years has been phenomenal, most of it due to plant automation, creative marketing, and the demand for nutritious, healthy, and price-stable protein that fueled the fish explosion of the mid-'80s. The numbers tell the story.

TABLE 1: CATFISH GROWTH PROFILE, 1980-1989[12]

	1980	1985	1987	1988	1989
Round weight processed (in millions of pounds)	46.4	191.6	280.5	295.1	341.9
Amount sold by processors (in millions of pounds)	27.7	99.2	146.5	149.5	176.1
Prices paid to producers (in U.S. cents per pound)	67.6	72.6	61.7	76.4	71.7
Wholesale price per pound of whole fish (frozen) in US $	1.73	1.68	1.54	1.74	1.66
Wholesale price per pound of frozen fillets (in US $)	n/a	n/a	2.52	2.76	2.61

Source: U.S. Department of Agriculture

In the 1980s, the catfish industry experienced a compound annual growth rate of 25 per cent. Projections for the 1990s indicate that if the industry achieves a compound annual growth rate of even 10 per cent, catfish will be a billion-pound industry by the year 2000.

3.2 The Production Process

Catfish farming begins with the careful selection and mating of quality brood stock. A brood fish, which remains in production an average of 12 years, will lay from 3,000 to 4,000 eggs per pound of body weight. The fertilized eggs are collected and placed in controlled hatchery tanks. After seven days at a temperature of 78 degrees Fahrenheit, the eggs hatch. The young fish are called "sac fry" because of the yolk sacs which supply their food. As the yolks are depleted, the fish begin to swim and are ready to be moved to a pond where they can grow into fingerlings. When the fingerlings are 4 to 6 inches long, they are transferred to catfish ponds at the rate of about 4,500 per surface acre of water.

Catfish is a vertically integrated industry in Mississippi, so the presence of feed mills and the ownership involvement of catfish farmers in the feed mills have become crucial elements in the success of catfish. The availability of feed (low transportation costs), the specialized nature of the local feed mills (producing only catfish feed), and the relative stability of feed costs have all contributed to keeping the price of farm-raised catfish reasonable (around $4.30 a pound retail). But since feed represents 40 per cent of the cost of producing catfish, any fluctuation in feed costs has a noticeable effect on the price of catfish.

It takes approximately 1.9 pounds of feed to produce one pound of live catfish. Thus, for every $50 per ton increase in feed costs, the cost of producing one pound of live farm-raised catfish increases by 4.75 cents. The conversation rate for other protein sources, however, is much less efficient: it takes eight pounds of feed to produce one pound of beef; the ratio of poultry to feed is 1 to 3, pork is 1 to 4.

Annual feed requirements for catfish are estimated at nearly four tons of feed per surface acre of water. Mississippi catfish are fed a "puffed" high-protein floating food pellet -- a mixture of soybeans, corn, wheat, vitamins, minerals, and fish meal -- which has a protein content of 32 per cent. This scientifically formulated feed is one of the reasons for the mild, sweet flavour of farm-raised catfish, and for the absence of any "fishy" odour during cooking.

It takes 18 months for farm-raised catfish to grow to market size (1 to 1.5 pounds). They are harvested with seines and loading baskets and placed in aerated tank trucks for shipment to the processing plant. They are kept alive right up to the minute they are processed, and the

entire processing procedure is completed in less than 30 minutes. The fish are cleaned, processed, and placed on ice or frozen to temperatures of -40 degrees F. using an IQF method that preserves the taste and quality of the fish. Mississippi processing plants can process more than six million live pounds of catfish per week.

Much has been made of the 30-minute processing period. The president and CEO of Delta Pride Catfish is fond of promoting the "fresher than fresh" image of catfish with the statement that "While most fish are still on the boat, ours have already been eaten." Like many aquacultured products, catfish has benefitted from its image as a "fresh," and "wholesome" protein item.

3.3 The Catfish-Chicken Connection

It is easy to point to landmarks in the development of the catfish industry. On the production level, it was the introduction of the hatcheries which enabled farmers to have control over supply. On the processing level, it was the advent of automation that boosted production by more than 1,300 per cent. Delta Pride, for example, now processes more than double the amount of catfish in one day as they did the whole first year they were open.

Catfish owes more to the poultry industry than it does to seafood when it comes to production and process control, and the path that catfish farmers have taken provides an interesting parallel to developments more than 20 years ago in the poultry industry. Catfish and chicken are both vertically integrated industries, so comparisons can be made all the way from grow-out to marketing and distribution. The fact that many of the original catfish pioneers came from the poultry sector is no accident; they were chosen in the hope that catfish could ride the same train to success.

The only significant difference between chicken and catfish, according to veterans of both industries, is who controls the eggs. In the U.S., the poultry processor owns the chicks and pays the grower a fee based on a feed-conversion ratio. The grower is just a babysitter; he takes no risks, and there is not much incentive there for him to work harder on producing a better-quality product. The co-op catfish farmers, however, own their product from beginning to end. They own the feed mills and the processing plants, the hatcheries and the trucks. Industry observers

feel this difference makes catfish a better-quality product in the long run. Poultry growers are not being paid to care about the quality of their products; they're only paid to produce the cheapest product possible. But catfish farmers are paid on the basis of quality, not cost. The fish are sampled three times prior to seining, and if they are even slightly off flavour, they are not harvested -- so it becomes advantageous to the farmer to aerate his ponds and feed his fish properly.

Most industry members date the beginning of the catfish explosion to the year that plants started being automated, in 1980. Since then, the industry has experienced annual growth rates as high as 30 per cent. In 1980, however, it was easier to look to the poultry industry for equipment and plant design than it was to look to the seafood industry. Poultry producers had been pioneers in plant design and process control, and the adaptation of poultry's methods of moving product in and out of a plant has advanced the catfish industry considerably.

A tour of any catfish - processing plant bears this out. All the major plants are automated to a greater or lesser extent, and nearly all the equipment has come either directly or by analogy from the poultry industry. And what they couldn't borrow directly, they had invented, primarily by the Baader Company which developed automatic filleting machines, eviscerators, and skinners.

3.4 Inspection: Focusing on Safety

Technically, catfish (because it is farmed) falls under the U.S. Department of Agriculture, but because it is seafood, it falls under the inspection system of the U.S. Department of Commerce and the National Marine Fisheries Service. Hence, USDA performs the record-keeping function, maintaining reports and statistics on the industry as a whole. It is generally agreed that the USDA has a good reputation for keeping track of the industries under its supervision, so the catfish industry is probably the one seafood commodity for which there are complete and accurate statistical records maintained on a regular basis. USDC/NMFS conducts inspections which, because they are voluntary, have an effect on marketing as well as safety. [NOTE: The issue of mandatory seafood inspection is currently under intense scrutiny. As of July, 1990, Congress has come to the conclusion that mandatory inspection is the way to go, but

has yet to decide whether it wants USDA, FDA (the Food and Drug Administration), or USDC/NMFS to oversee the program.]

In addition to government-sponsored inspection programs, the industry also conducts product-safety checks. The industry (processors and producers) routinely inspect water quality, fish contamination, quality of finished product, and product handling. Inspecting for plant sanitation and product quality is carried out through the "Mississippi Prime" program run by The Catfish Institute.

3.4.1 Individual Plant Inspection Systems

Any company that owns pond acreage or has an interest in stock, wants to ensure the quality of its supply from the beginning. Consequently, soil testing (especially since catfish are being grown in soil where cotton was farmed using DDT) is important. Ponds are filled with fresh spring water which is monitored and tested on a weekly basis to ensure that cleanliness and proper oxygen levels are being maintained. A recent year-long study on the nutritional quality and safety of Mississippi farm-raised catfish revealed no detectable amounts of contaminants or heavy metals. In addition to private testing, the Food and Drug Administration (FDA) also conducts random testing of harvests, plants, and ponds.

Once catfish are ready for harvest, sample fish from every pond are tested by in-plant quality-control departments. Taste testers check the aroma, appearance, texture, taste, and size of every sample looking for catfish with a buttery flavour, a mild nutty aroma, a firm texture, and white flesh. Many samples from each pond are taken before processing, including one several weeks before harvest, one the day before harvest, and one before the fish is unloaded for processing. If the samples do not meet quality-control standards (flavour in particular), the entire harvest from that particular pond is rejected.

Most of the cause for rejection is off flavour, the result of a blue-green algae called geosmine that grows in pond water, particularly during the warm-weather months. Although off flavour can result in the rejection of up to 80 per cent of all fish samples during August and September, the condition will correct itself, and most farmers prefer to leave their fish in the ponds rather than trying to find a buyer that will accept off-flavour fish. Off flavour is a

persistent problem, one which biologists working on the problem through Mississippi State University (MSU) have been able to identify and, to some extent, control, but not eliminate.

Because of the importance of catfish to the state's economy, MSU has attracted a number of biologists who do nothing but work on catfish. The most active research area currently is genetics, specifically research into growth and feed-conversion rates of various strains of channel cats. The other hot topic is "albino" catfish, a move also developed by analogy with the poultry industry which found greater market acceptance in a white-skinned bird than in a red-skinned one. Although the difference between albino and regular catfish is only noticeable in the whole-dressed fish, several researchers are continuing to experiment with the form.

3.4.2 Mississippi Prime Inspection Program

Most major catfish companies participate in The Catfish Institute's "Mississippi Prime" inspection program. Registered trademarks of TCI, the Mississippi Prime name and logo identify the premium product of the Mississippi farm-raised catfish industry. Since there is (as yet) no mandatory federal inspection of seafood, this inspection program is considered by most processors to be extremely important in assuring consumers of the freshness and healthy attributes of their products.

Each of the seven processors approved to carry the Mississippi Prime label must participate in a weekly inspection program developed by TCI in cooperation with USDC/NMFS and conducted by a USDC inspector. In addition, licensed plants undergo continuous unannounced lot inspections (also carried out by USDC agents) that test flavour and inspect for processing and product defects.

The Catfish Institute created the Mississippi Prime inspection program as a way of showcasing catfish as a safe, healthy, and nutritious product. It is a case of an industry putting its money where its mouth is. The Mississippi Prime logo is prominent in TCI's consumer advertising, and shoppers are encouraged to look at the label as a kind of "Good Housekeeping Seal of Approval," evidence of the industry's commitment to create and market the best and safest products possible.

In order to have the proof it needed to back up its comprehensive inspection program, The Catfish Institute commissioned a year-long study on the nutritional quality and safety of Mississippi Prime catfish. The study was conducted between 1987 and 1988 by Dr. Joyce Nettleton, and was specifically designed to examine the nutrient and contaminant profile of samples of Mississippi Prime farm-raised catfish. The research indicated that catfish is an excellent source of high-quality protein; is low in cholesterol, calories, and sodium; and has no measurable risk to human health from PCBs or other residues of chief environmental or health concerns.

The timing of this study was fortuitous as publication of the results coincided with some of the worst episodes of ocean contamination in U.S. history. As the bad news continued to surface, catfish advertising became more prominent, hammering home the issues of inspection, quality, taste, price -- and the big one, safety. Thus, partly because it was done well, and partly because of the confluence of events, the Mississippi Prime logo, together with the inspection program behind it, has become a powerful weapon in the fight for market share.

4.0 MARKETING, PROMOTIONS AND SALES

4.1 The Catfish Institute

Marketing is one of the areas where the catfish industry stands above most producers in either the capture fishery or the aquaculture sectors. Most of the industry's marketing success is due to The Catfish Institute (TCI), founded by a group of Mississippi catfish farmers and processors in 1986 as a mechanism for furthering public awareness of the positive qualities of Mississippi farm-raised catfish. Based in Belzoni, Mississippi, TCI monitors the growth and direction of the industry and serves as an informational resource centre on the state's catfish industry. A board of directors, composed of 10 elected delegates from three Mississippi Delta feed mills, oversees the operation of the organization and its marketing programs. The feed mills fund TCI with $6 for every ton of catfish feed sold. This fee automatically provides an annual budget of $1.5 to $2 million for marketing and promotions. TCI is involved strictly in marketing and promotions, but the executive director also serves as a liaison between the processors and farmers, and assisted farmers in developing a bargaining association in 1989 (see section 5.2).

TCI first had an effect on the market in 1987, a pivotal year in the short history of farm-raised catfish. The overall scope of the advertising campaign was ambitious, but simple: to make every consumer in the United States aware of the benefits of purchasing and consuming farm-raised catfish. The first of TCI's advertising campaigns broke early in 1987 with full-colour spreads in consumer publications like *Better Homes and Gardens, Family Circle, Time, Newsweek*, and *People*. The ad, called "In Praise of the Lowly Catfish," was designed to get people thinking in a new way about a species they might have overlooked because of preconceived ideas. Response to the ad was overwhelming. A coupon in the ad offering a recipe book generated more than 25,000 requests (even though the book cost $1.50). Audits of clippings and placements revealed 1,790 placements in print and electronic media during the first six months of 1987, making over 200 million consumer impressions. If each of these 200 million consumers were a different person, catfish advertising would have been seen by almost 90 per cent of the population of the United States in 1987.

TCI's efforts, combined with individual sales and marketing campaigns conducted by processors, made 1987 red hot for catfish. By the time it was over, the industry posted gains of almost 30 per cent, with farmers producing 62 million more pounds of product than they had in 1986, and sales by individual processors up anywhere from 32 to 50 per cent.

In 1988, TCI expanded its marketing drive. Working on the premise that it's easier to get someone to eat more of a product they already consume than it is to get someone to buy it for the first time, TCI developed what has come to be known as the "inverted T" or "heartland" strategy. The "inverted T" accesses all those markets where the "southern" influence is felt -- the southern tier of states from Florida to California, and up the Mississippi River valley to Chicago. The 1987 campaign began the drive; the 1988 campaign finished the effort in Los Angeles. Research indicated that more than one million pounds of catfish are distributed into the Los Angeles area every year, so it made sense to put on an advertising push in that city. In 1989, the middle tier of states (Georgia, Kentucky, Nebraska, South Carolina) were added, along with the Baltimore-Chesapeake Bay-Washington, D.C. area.

The theme of the 1988 campaign positioned catfish against its chief competitors -- beef, pork, and poultry. "Think of it as a chicken that doesn't cluck," read one ad. *Restaurants and Institutions Magazine* called 1988 "The Year of the Catfish," and it seemed as if catfish was on

a roll forever. Copy in the new ad series included tables showing USDA figures for the caloric, cholesterol, and fat contents of pork, chicken, and beef contrasted with those of catfish. This was perhaps the first time that such comparisons had been made in a consumer ad.

The 1989 campaign was revised so that the industry could capitalize on consumer concerns about the pollution in ocean fish, hitting hard on the theme of the cleanliness and quality of farm-raised catfish. This was the first year of a "repositioning" campaign that has continued into 1990. Cod and catfish have this in common: both are trying to move up from commodity item to centre-of-the-plate status. The North Atlantic Seafood Association (NASA) has spent a large chunk of its budget over the last several years in developing elegant and sophisticated recipes for cod that would change people's perception of the fish, consequently allowing purveyors to up the price. The Catfish Institute is working on the same agenda: upgrading the product out of the fast-food category so that it can be priced away from pollock and cod.

The thrust of TCI's 1990 campaign is toward taking catfish out of the fried-food category by emphasizing the versatility of the fish.[13] The theme is "Catfish: The World Tour," and the campaign focuses on international/ethnic recipe preparations. Ads are also for the first time being directed at chefs and seafood buyers (in addition to consumers) in an effort to reach the thought leaders, showing them recipes and educating them on what can be done with catfish. A 100,000-piece direct-mail campaign to the middle level of chefs and retail-seafood buyers was planned to announce the consumer campaign. The mailing suggested that stores and restaurants stock up on catfish in anticipation of consumer demand, sparked by advertising. Getting market pull from that critical middle level of chefs and retail seafood buyers is imperative to any repositioning move.

TCI is not (with the exception of Texas) running print advertising in heartland states in 1990. Feeling that the mission has been accomplished in those traditional areas, TCI has surrounded the "inverted T" with a "rainbow" and is targeting those states that form a rainbow shape around the heartland. Consumption is growing in states such as Arizona and Colorado, disposable income is high, and distribution is no problem -- all the makings of a successful marketing campaign. Catfish print ads are already appearing in regional publications in

"rainbow" states, complemented by national advertising in magazines like *Cook's, Bon Appetite,* and *Gourmet.*

The importance of The Catfish Institute in the development of the industry as a whole should not be underestimated. In addition to running well-funded generic programs, the Institute has helped the industry learn the benefits of cooperation. Of course, competition has not ceased -- in fact, it has become more intense -- but in the media and in the marketplace, everyone sings the same song. Everyone knows the trick is to sell more catfish; if that happens, each individual will get his share.

4.2 Individual Company Efforts

The catfish industry as a whole is very clear on the difference between sales and marketing. All the majors have marketing departments distinct from sales, and all are active in promoting their products, regionally, nationally, and occasionally even internationally. Marketing and sales, while they are closely associated in the minds of many, are quite separate functions in most catfish companies. As one catfish executive explained it, "Marketing comes before sales and after sales." In the catfish industry, marketing departments condition and develop markets for sales, and once the sales have been made, marketing re-enters with support. Most of the major catfish processors are in agreement on the issue of marketing support -- "it helps our customers sell our fish," commented one marketing manager.

Examples of marketing support programs include quarterly promotions, chef tours, collateral materials, advertising, public relations, and new product development. Each of the majors employs separate advertising and public relations agencies to develop materials and work up programs for them which are then administered to in-house personnel.

Delta Pride is currently running a "Catfish Seasoning" promotion where the customer is given a packet of specially mixed seasonings with a one-pound purchase of catfish. Cooking instructions are printed on the seasoning package. The Aqua Group was the first out with a special promotion for catfish in the deli department, emphasizing the fast, easy preparation of stuffed catfish fillets. Several of the majors have executive chefs who travel around the country

promoting their company's products. Probably the most famous of these catfish celebrities is Louisiana chef John Folse who is under contract to Delta Pride. Folse makes regular cross-country swings promoting Delta Pride catfish with radio, television, and newspaper interviews, chef association and key customer presentations, and in-store demonstrations. He also serves Delta Pride's customers by developing signature items and hosting select customer events. Folse received international media attention when Delta Pride sent him to Moscow to cook at the Kremlin for the Moscow Summit in May, 1988.

The catfish industry is very conscious of what it has to do to be a "hassle-free" supplier. In a time when there are many seafood choices available, service is what sets one supplier apart from another. Catfish processors are completely service-oriented, offering such point-of-sale materials such as posters, case cards, recipe cards, and brochures, ice picks, and ad slicks to make merchandising easy. In some cases, off-invoice allowances, billback advertising, and introductory in-store demonstrations sweeten the pot.

For the past five years, *Seafood Business* magazine has run a survey of supermarkets in the U.S. and Canada. Every year, one of the questions is, "What do retailers need to sell more seafood?" -- and every year, retailers say they need more help from suppliers. The catfish industry has worked hard to give retailers what they want, and buyers have rewarded them with increased sales.

4.3 Branding and Adding Value: The Shift from Commodity Items to Consumer Products

One of the ways the catfish industry has been successful in moving its product from commodity item to consumer good was branding, another move pioneered by poultry. Having seen the rise in poultry sales following that industry's shift in focus from production to marketing, the catfish industry followed suit, barely bothering to experiment with an unbranded product. "You can't extract a premium price from a product a consumer can't identify," commented one catfish CEO. Branding, supported by The Catfish Institute's consumer advertising and bolstered by individual companies' marketing and promotions, has had a real effect on catfish sales. Consumers in the areas heavily penetrated by catfish marketers are now

accustomed to buying their catfish by brand name. Each of the majors has a logo and a package design that helps consumers identify individual packs.

The major catfish processors have been successful in branding their products because they have a consistently high-quality item that they can put their name on and support with advertising. The consumer has perceived a better value for the money in this product, and is willing to pay a premium which covers the cost of the promotion. Consistency is the name of the game, however, and only those companies that can track product from beginning to end and ensure that only the best quality receives the brand can profit from using it. And because branding and promotion force competition and leave little room for inferior product, the consumer benefits. Branding has been particularly effective for catfish because North American consumers are naturally cautious about purchasing seafood. With a branded product, consumers can be more confident they are getting fresh, consistent quality every time.[14]

Another move adapted from the poultry industry and forced by the intense competition within the catfish industry was the move to value-added products. With automation came the ability to create different, but still basic product forms such as fillets and steaks. Concurrent with that development was breading (since that was part of the automated line), and the industry went to town creating its most popular items, the breaded nuggets, fillets, strips, and steaks that are served up on fried platters around the country. The production breakdown illustrates the growth.

TABLE 2: PRODUCTION BREAKDOWN
(in millions of pounds and as a per cent of total)

	1986		1988		1989	
	lbs.	%	lbs.	%	lbs.	%
Total catfish sold	113.9	100	149.5	100	176.1	100
Whole fish	52.9	46.4	55.5	37.1	62.0	35.2
Fillets (some value-added)	42.0	36.9	64.2	42.9	80.5	45.7
Other (all value-added)	19.0	16.7	29.9	20.0	33.6	19.1

Source: U.S. Department of Agriculture

The U.S. consumer's shift to healthier food caught the industry's attention early. A small Mississippi company called Aquaculture Products (since absorbed into The Aqua Group) was the first to develop the idea of a flavoured fillet (a fillet with sauce either glazed on or marinated into it), but Delta Pride was the company that really brought the concept to market. Now, virtually every company produces a glazed or marinated line, the most common flavours being Lemon Pepper, Cajun Style, Garlic Butter, Blackened, and the latest -- a new Barbecue flavour. These products provide for goof-proof preparation, either by the consumer or by foodservice personnel. They can be cooked frozen or slacked out, with cook times ranging from 8 to 17 minutes. Several companies have gone one step further, marinating a line of catfish nuggets that can be served as appetizers or finger food.

The glazed/marinated products were enormously successful with retail and foodservice customers and clients, and the major catfish processors felt comfortable expanding into other types of value adding. Farm Fresh (the Hormel subsidiary) added stuffings to their seasoned items, producing Lemon Florentine, Crabmeat Caravelle, and Cajun Supreme stuffed fillets all conveniently tray packed for retail sales. Farm Fresh, considered by industry observers to be one of the most innovative companies in terms of value-added products, also rolled out a microwaveable boil-in-bag catfish gumbo, fajita catfish strips, and catfish croquettes made from minced catfish (obviously an effort at waste utilization). Southern Pride Catfish will showcase a new smoked catfish fillet in 1990 (although smoking has been tried by other processors with less than stellar success).

Some of the smaller companies are looking at adding value as a way out of the commodity-item bind that some major processors have found themselves in. The Aqua Group, although a young company, has already become a significant player in the value-added arena, having premiered a new line of dry-seasoned products, and two foodservice items, both of which blend catfish and crawfish together in a breaded patty. Adding value gives the processor the advantage of selling by portion rather than by price, a method which renders a much better price per pound for product.

4.4 Sales and Distribution

A coordinated sales strategy has always been important to the catfish industry, especially given its location in the deep south. The industry found out early that it couldn't keep its sales people down home in the Delta and expect them to be able to sell catfish into major markets. The image of a sleepy backwater town was too much to overcome. So only the sales manager stays in the Delta; the rest of the huge network of zone managers, regional directors, brokers, and sales people are out in the field where they need to be to sell catfish.

When it comes to hiring sales executives, the majors at least have put some of their best money into attracting t e with proven sales track records. At first, it seemed the industry was looking for the next Frank Perdue (the man who put brand-name chicken on the map) with the number of people it convinced to cross the road from poultry to catfish. But the industry is looking further afield now, hiring successful salesmen from other fields both within the food sector and outside of it. Delta Pride's marketing director comes from a similar position at the Hershey Chocolate Company, for example, while the vice president of sales and marketing for America's Catch came to the company from pharmaceutical giant, Johnson & Johnson.

Corporate raiding is also popular. In its first year of operation, The Aqua Group recruited a number of sales and operations people from Delta Pride, while Country Skillet convinced a couple of others to cross over to the competitor. Most catfish companies are like other operations within the seafood industry in this respect. The industry is small and located within a very circumscribed geographical area, so most people (especially if plant workers are included) end up working for several companies during the course of their careers.

Most of the catfish produced in the course of a year are sold into the two principal distribution channels -- retail and foodservice. Typically, products are introduced into foodservice first, making their way to retail if they succeed in restaurants. Overall, the break-out for each sector is roughly 50-50, although individual companies may specialize in one sector over another. Several companies have addressed institutional business, even though that is a difficult market to tap. Farm Fresh was the first to receive CN (Child Nutrition) approval which almost guaranteed its catfish products a place on school-lunch programs. Delta Pride and Country

Skillet sell to the military; all the majors are active in selling to hospitals and in-plant feeding operations where the concept of healthy food goes a long way.

When the industry was growing at the rate of 30 per cent a year, problems developed, particularly with distribution. Following the development of The Catfish Institute's first series of consumer ads in 1987, catfish got so much play on television and in print, that distribution (particularly in the Northeast) could not keep up. Too many consumers were going to their supermarkets and finding the cupboard bare.

In the very early stages, catfish was frequently distributed with poultry and brokered by the same person. As business developed, the major catfish processors bought fleets of trucks; however, economies of scale dictated that those trucks go where the business was, so most trucks travelled routes in the "heartland"; not too many went to New York. The Northeast is an anomaly in several ways: it is a major groundfish producing and consuming area so catfish sales were slow; moreover, most business is traditionally done through big markets in New York, Baltimore, and Philadelphia making the distribution system difficult to crack. Yet this is an area that fancies itself on top of trends -- if something is "hot," it is available, and if it isn't available, it can't be "hot." So when consumers in New York looked for catfish and couldn't find it, the catfish people had a problem. To some extent, they have not recovered from that problem. Distribution is better, but the market hasn't improved much, especially when groundfish prices declined in 1988 and 1989.

Marketing strategies for cod and catfish differ radically. The catfish industry has worked to develop a systematic and broad-based distribution program that will, eventually, cover the entire United States. Over-dependence on one market is avoided, and the broad base gives support for penetration into new regions. It is generally agreed, however, that most Canadian cod exporters rely almost exclusively on the Boston distribution system leaving to U.S. distributors the benefits -- and the headaches -- of finding buyers. Clearly this system offers advantages to Canadian exporters, but there are significant drawbacks as well, not the least of which is that Canadian groundfish exporters are insulated from the realities of the marketplace. As long as they can find a Boston middleman, they don't have to worry, and because the catfish companies have not pushed market development in the Northeast, there is little competition in that specific

region. But that situation will not last forever. Once catfish marketers have decided to get into the Northeast, they'll go prepared, with a marketing strategy and money to back them up.

5.0 PROBLEMS IN THE INDUSTRY

5.1 Imports/Wild Crop

The aquaculture industry in North America has cause to be concerned about imports. Land and labour costs make aquacultured products grown on this continent among the most expensive in the world. Although the catfish industry does not have to worry about land use conflicts (the big issue for aquaculture operations on the coast), and even though land and labour costs in the Mississippi Delta are among the cheapest in the nation, imports keep coming in. Not a lot -- the 6.8 million pounds in 1989 has been about the average for the last eight years -- but enough to be a nuisance in some markets. The vast majority of catfish imports come from Brazil, but the Mexican government is looking at aquacultured catfish as a new crop, farmed in northern states where the soil is similar to that found in Mississippi and the distance to the border is not great. A certain type of soil, a source of fresh water, cheap labour, and warm weather are the principal components of catfish farming. However many countries fit that bill is the number of countries that might in the future be exporting catfish into North American markets.

More of a problem in the near term is the yearly crop of domestic wild catfish. It is the same species, but in its wild state, it feeds on anything and everything, making its flavour stronger and less palatable to those looking for a fish that doesn't taste fishy. Even though aquacultured catfish are always marketed as "farm-raised" (in fact one rarely sees Mississippi catfish without that designation), some wild product invariably slips in and causes a minor upset for a while. There is really nothing to be done about it, except to continue the education process so that ultimately, people will know the difference. It's not a very large problem (only 5.4 million pounds were caught in 1988), and is for the most part confined to southern Louisiana, Mississippi, Alabama, and Texas.

5.2 Catfish Bargaining Association

Despite the fact that catfish marketers have used price stability as one of its main selling points, pricing has rarely achieved any real equilibrium within the industry itself. From 1985 to 1989, average prices paid to producers have ranged from 66.8 to 76.4 cents per pound.

TABLE 3: PRICES PAID TO PRODUCERS, 1986-1989

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann Avg
1986	70	70	72	74	72	68	66	63	63	62	61	61	66.8
1987	60	57	59	65	69	64	61	60	60	61	62	64	61.7
1988	68	72	75	75	75	78	80	80	79	79	78	78	76.4
1989	78	78	77	76	76	75	71	68	65	64	64	68	71.5

Source: U.S. Department of Agriculture

High prices have historically been paid for live fish during the first half when demand is greatest and supply is poorest (see also Appendix C). During the second half of the year, live prices normally fall due to high supply and reduced sales demand (except in 1988 when farmers first attempted to establish a pond-bank price floor). Processors have traditionally used the period from August to December to drive the price of live fish below the producers' cost to grow them. In an effort to control their destiny, the farmers decided to do something.

Through The Catfish Institute, farmers formed a collective bargaining association that has enabled them to negotiate a price for their crop. The Catfish Bargaining Association (CBA) was formed along the lines of other industries (primarily agricultural in California) where crops were sold through collective farmer bargaining associations. The CBA currently represents 90 per cent of catfish producers in Mississippi, Arkansas, and Louisiana; in addition, almost all processors in Mississippi, Arkansas, and Louisiana agreed to recognize the CBA as the farmers' agent. The CBA established minimum live-fish prices of $.75 per pound effective January 15, 1990. Since then, the price has risen to $.80 a pound, but will not go higher until a new contract is negotiated in July, 1990.

It is as yet unclear whether the net results of the CBA will be positive or negative. The association certainly introduces a new wrinkle into catfish pricing and into the ability of processors to buy easily on the spot market. But the real effect will come at the retail level. With a live-fish price of $.80, wholesale fillet prices rise close to the $3.00 mark. Although retail prices across the country have remained stable for the last several years (at $4.30 a pound), there is always the potential for a retail price hike if the wholesale price gets too high. The industry does not yet know how things will shake out. Company officials indicate that buyers are watching to see what price the market will bear since the price at which producer, processor, distributor, and retailer can make a fair profit has yet to be determined. What will happen after July remains to be seen.

5.3 Processing Overcapacity

Atlantic groundfish companies are not the only ones struggling with overcapacity in the processing sector. In 1986, there were 19 processors in the catfish industry. By 1989, there were 33. Currently, the capacity to process in the industry versus the availability of live fish to process is about three to one, so it was inevitable that new plants, struggling to gain market share, opted to lower prices. In October of 1988, shank fillets were wholesaling in the $2.75 to $2.85 a pound range. But by the end of the year, the price had dropped to $2.40 a pound, occasionally plummeting to $2.20 when processors needed to get rid of inventories.

When this started, the Big Four weren't too worried, thinking they could outlast the group of new processors. But the price war went on for more than a year with virtually every processor selling at prices that (they claim) haven't covered costs. Industry observers have been predicting a shakeout, but it hasn't happened yet. The efforts of the Catfish Bargaining Association may force the situation, however, since processors will no longer have the option of dropping prices to farmers.

It should be added here that the companies accused of lowballing don't agree with the assessment. They see themselves as being more responsive to customers -- giving them low prices for fish rather than the accrual programs, marketing money, or in-store demos that have pushed other processors' prices higher. These companies believe that the overcapacity argument

is an excuse for poor performance by the Big Four. They should have paid more attention to their own business and worked harder on building their own customer loyalty" is their argument. The companies accused of lowballing have been successful in their goal to gain market share; processing projections suggest that within six months, one of them will be in fourth place, while another will be in fifth, with the current fourth-place company dropping into sixth.

One thing should be made clear: the catfish industry is well financed, has manageable debt, and a product whose market share is increasing. Virtually every executive in every plant would agree that the problems brought about by overcapacity and the CBA are short-term, the result of rapid growth in both supply and demand. Imports represent a long-term and (at the moment) rather vague threat that no one seems overly concerned about. The problem with the wild crop is persistent, but not large, and will be handled over time through education. As far as competition with other seafood species is concerned, catfish executives never really articulate that as a "problem." They have respect for other seafood sectors and they watch price and supply activity carefully, but they have always positioned their products as agricultural commodities rather than as marine items. Thus their advertising centres on comparing catfish with chicken or pork rather than cod or pollock. For many reasons, the catfish industry doesn't think it has very much to fear from the groundfish group.

6.0 CONCLUSION: IMPLICATIONS FOR CANADIAN GROUNDFISH EXPORTERS

6.1 Selling Points for Catfish

In 1989, consumption of farm-raised catfish in the U.S. increased from 295 million pounds live weight to 342 million pounds, up 47 million pounds, or 16 per cent. Catfish broke into the top ten seafood categories in the U.S. three years ago, and its market share has kept growing. U.S. per capita consumption of farm-raised catfish now exceeds 0.75 pounds (up from 0.50 pounds in 1986) and continues to grow. In comparison, per capita consumption of Atlanti cod in the U.S. is estimated to be less than twice that of catfish -- 1.47 pounds in 1989, a decline from 1.99 pounds during the period 1981-86.

Clearly, catfish marketers have taken advantage of every issue -- product safety, water pollution, inspection, reliability of sources -- to push their product as the one that offers consumers the most benefits with the least risk at an attractive price. Some of the selling points frequently used include:

Freshness	Mild Flavour	Elegant
Nutritious	Easy to Prepare	Versatile
Farm-Raised	Grain Fed	Price Stable
Fresh Water	Availability	Safe

Because of the tight controls in-plant combined with the Mississippi Prime inspection system, the catfish industry can ensure these benefits to its customers in a way that many other seafood sectors cannot.

6.2 Competition for Market Share

Despite the inroads that catfish has made into traditional whitefish markets over the last nine years, Canadian groundfish exporters may not yet perceive it as competition. For one thing, the amount of catfish produced is still less than cod, although those numbers are changing fast. For another, catfish is rarely (if ever) mentioned as a cod substitute, so the attention of cod producers has never been officially directed at it. For a third, the marketing strategy of the industries is different in that the concentration of Canadian cod exporters has historically been directed at the Northeast (specifically, Boston) while catfish marketing has been developed to target the "heartland" of southern and mid-western states. Finally, cod has had much greater penetration (over a much longer period of time) in fast/fried-food operations, chiefly McDonald's, Burger King, and Long John Silver's.

When it comes to Europe or Japan, cod exporters have it all over catfish since very little catfish gets exported -- that's not their strategy. And if one considers only those geographical areas or market sectors where groundfish dominates (like the Northeast or fast food), then there appears to be very little competition. So to some extent, the threat that farm-raised catfish poses to Canadian groundfish exporters is potential rather than actual. But that doesn't make it any less real. There can be little argument that groundfish supplies are declining while catfish supplies

are on the rise, and this is a trend that can realistically be expected to continue for the next few years at a best-case scenario. There can also be little argument that marketing and promotional funds for groundfish are decreasing (NASA funding is at an all-time low of $150,000 for 1990) at the same time as funding for The Catfish Institute is increasing. Catfish companies have not had to suffer the slings and arrows of adverse public opinion over the past two years, and have, generally speaking, maintained a profitable posture over the past five years. This industry has conducted a serious price war for the past 18 months with no casualties; this fact alone speaks volumes as to the solvency of the industry in general.

Cod exporters have been hit hard in the last several years, first by price increases that allowed new species to compete in traditional cod markets as "cod substitutes," then by falling prices (also caused to some extent by the entry of new species), then by pollution scares and the general concern over seafood safety. Now there are serious questions being asked about the strength of the groundfish resource worldwide, causing quota cutbacks, industry instability, and -- once again -- price increases. Cod has lost market share over the past three years, partly because of price fluctuations, but mainly because of the much wider variety of seafoods available to buyers and consumers. Catfish, with its "user friendly" and branded-product appeal, its image of freshness and safety, its availability and relative price stability, has got to be considered as significant competition for Canadian cod exporters.

As both industries seek out new markets (and both must in order to stay profitable), they can expect to encounter each other in a much more competitive way than has hitherto occurred. The catfish industry, as a whole, is very methodical, deliberate, and organized about its marketing efforts, rarely going in for a one-shot deal or to get rid of product it can't sell to regular buyers. Because no one in this industry has come from the capture-fishery sector, there is little of the capture-fishery (catch it while you can and worry about selling it later) mentality present here. If there aren't ready buyers, catfish can be held in the ponds until the buyers are there, and while there are always those that have to sell for cash flow, panic selling is not a pervasive problem in this industry.

So when catfish marketers go into a region, they go there with a specific plan, a focused message, and a lot of staying power. Having control over their destiny -- over supply, costs, pricing, and quality -- has thus far given them control over markets. They put a lot of money

into consumer research, focus groups, interviews, and "product previewing" through seminars, media events, and in-store demos. They also spend a great deal of time, money, and effort developing detailed marketing strategies, and they can't be scared away from them easily.

Catfish marketers acknowledge that there are pockets of hard-core cod consumers who will likely never change their preference. But they believe that is a small (and perhaps even diminishing) population compared to the vast numbers who are willing to try something different. Catfish marketers believe their success lies in increasing the frequency of occasional eaters, encouraging consumers to think of catfish as a staple similar to pork, beef, or chicken, and in getting non-seafood eaters to try catfish once. It is a common saying around the industry that if you can get a person to try catfish once, you've got a customer for life. But in areas where the competition from traditional seafoods is fierce (i.e., the Northeast and the Northwest), catfish has thus far stayed away. Like Red Lobster (another company with a savvy marketing strategy), the catfish industry has enough to do without worrying about changing centuries-old taste patterns. Rather than go head-to-head with cod in cod's own markets, the catfish industry prefers to let declining resources, pollution, nematodes, and inferior marketing take their toll.

6.3 The Cost of Competition

The real litmus test of profitability is competition. When one speaks of competition to Atlantic cod in U.S. markets, one hears, primarily, Pacific cod, Alaska pollock, and sometimes, New Zealand hoki. Yet farm-raised catfish is undoubtedly cod's biggest competitor in U.S. markets. Canadians exported roughly 745 million pounds of cod to the U.S. in 1989; catfish produced 342 million pounds during the same year. The amount of Pacific cod sold in the U.S. is less than either number, and even though the sale of Alaska pollock fillets is growing in U.S. markets, the majority still goes into surimi. New Zealand hoki isn't even close.

When catfish, Alaska pollock, and Canadian cod are set side-by-side for the years 1987 and 1989, the picture (for fillets only since other product forms can't be compared) looks like this:

TABLE 4: MAJOR FILLET SUPPLIES CONSUMED IN THE USA
(in millions of pounds)

	1987	1989
Catfish fillets	93	135
dressed (fillet weight)	30	40
Total	123	175
Alaska Pollock fillets	80	110
Canadian Cod fresh fillets	24	22
frozen fillets	84	77
Total	108	99
Total Above	311	359

Source: Canadian Association of Fish Exporters

The cost of raw material may be greater for catfish than cod, and capital investment (especially in the newer plants) may carry a greater financing burden than some cod-processing operations. But that's about it. Catfish has a whole-dressed yield of 61 per cent (head-off, skinned, and eviscerated with bones in) and a fillet yield of 44 per cent (including the popular nugget made from the bellyflap); labour costs are lower (even though the major plants are unionized, the scale in Mississippi is lower than it is in Canada); transportation costs are less (company-owned fleets go direct to the distributor/retailer); and there is less financing necessary for buying and storing product (most product is sold in IQF whole-dressed or fillet form, but that is out of convenience, not necessity; except when inventories are being built up for Lent, product is turned over quickly, all year long).

In addition to these advantages, there is The Catfish Institute and the hefty marketing and promotions budgets of the individual processing operations. Two points bear mentioning here. First, The Catfish Institute's marketing and promotions efforts are sustained, because the Institute

is funded at a rate of $2 million *every year*. The renewable nature of the resource has both mandated and ensured renewable funding for its promotion. Second, an example of how the leading catfish company reacted to crisis: As reported earlier (in Section 5.3), the major catfish processors have been under seige from new companies lowballing for market share. Delta Pride, the industry leader, fought unsuccessfully to raise prices for close to a year, thinking they could outlast the companies selling low. Finally, in early 1990 when the situation had reached crisis proportions with the Catfish Bargaining Association coming on line, Delta Pride invested in television and radio advertising, the first in the industry to mount such an intensive media program. Follow-up interviews already indicate an increased brand-name awareness and consumer demand for Delta Pride's product.

6.4 Quota Cutbacks: A Chance to Rethink Marketing Strategies

In a way, the cod quota cutbacks have come at a good time. If Canadian cod producers had had the same amount of raw material to process in 1989 as in 1988, where would it have been sold? Canada's 1989 cod landings were down by 51,000 mt,[15] the equivalent of about 40 million pounds if produced as fillets. What would have happened to that product? In all likelihood, it would have pushed both fillet and block inventories in the U.S. high enough to send the industry into the same kind of excess supply spiral that in the past resulted in price declines.

The 1990 cod supply picture is known. If cod producers, processors, and exporters can accept the resource realities, this period of stock rebuilding could serve also as a time for re-evaluating marketing strategies. In fact, it might be advantageous for the industry to step back and take a new look at what's happening to U.S. markets for cod, and try to determine how Canadian exporters can get the most out of them. The focus of seafood producers around the world is changing. Production, supply, and resource issues, while important, are not the be-all and end-all of existence any longer. The focus is shifting from production to marketing, from commodity items to consumer products. It is this writer's opinion that if Canadian cod exporters are going to be able to meet the challenges offered by so many species in so many of their traditional markets, a shift in focus is necessary. Energy needs to be put into creating profitable value-added products (determined by the marketplace), into doing something significant in terms

of marketing and promotion, into getting better distribution networks (to reduce dependency on Boston), and into working with each other as members of a common seafood exporting community. Catfish processors have been working on these very issues for the past nine years, and the results are evident and astonishing.

6.5 What Can Cod Learn From Catfish?

Looked at from one angle, the answer to this question is: Nothing. Although they are both seafood, the fact that one is farm-raised while one is wild makes all the difference, since an aquacultured product allows luxuries of control that simply don't exist for wild products. Unfortunately, mainstream thinking usually stops here; the products and the fisheries have nothing in common, and that's all there is to it.

But looked at from another angle, Canadian cod exporters could learn a lot from catfish. The catfish industry stands out as an example of what is possible -- when people agree to work together even though they are intense competitors, when they put on a united front in their markets for the good of the industry overall, when they believe in promotions and marketing on a generic as well as individual basis, when they are willing to accept change even though its consequences are uncertain, and when they are willing to fund initiatives even though there is always the chance they might not work out.

Much has been made in this report about the marketing and promotions efforts of the catfish industry, but it must be emphasized again that it was the combination of generic and branded approaches that achieved results. Initially, the marketing and advertising strategy of The Catfish Institute was designed to move fish -- that was its aim. Now the focus has shifted to moving fish at an improved price, a shift made necessary by increases in pond-bank prices. For whatever reason, whether it's a decline in supply or a rise in producer price, both cod and catfish are looking for higher prices for their finished products. It has frequently been the argument of the capture-fishery sector that marketing and promotions create a demand which cannot then be filled if supply is short. But the answer to short supply and heavy demand is increased price; this has already happened with cod. What marketing and promotions do is keep that demand steady -- not disintegrating in the face of short supply. What The Catfish Institute did for the

processors in the Mississippi Delta was to achieve "top-of-mind awareness" for catfish, so that buyers and consumers asked for "catfish" instead of "fish". Catfish buyers are now motivated by product rather than by price, a selling point that is all but lost to cod suppliers.

The more one knows about one's competition, the better prepared one is in the marketplace. What Canadian cod exporters should know about farm-raised catfish is that these guys mean business. They've got a premium white-fish product that is nutritious, easy to prepare, priced at a reasonable and stable level, available all year long, and safe. Most important, however, is that it tastes good (i.e. not like fish). They've got deep pockets, and when they're in a market, they're going to stay there. In other words, catfish represents significant competition for cod, and while the struggle for market share isn't over yet, the heat is definitely on.

NOTES

[1]Each year, the National Fisheries Institute (NFI) takes the numbers generated by the National Marine Fisheries Service (NMFS) and published in "Fisheries of the United States," and comes up with the "top ten" most consumed seafoods in the country. In 1988, the top ten species were tuna (canned and fresh/frozen), shrimp, cod (Pacific and Atlantic), Alaska pollock, flatfish, clams, catfish, salmon (canned and fresh/frozen), crab, and scallops. These ten species accounted for 80 per cent of the 15.2 pounds per capita of seafood consumed in the U.S. in 1988.

The 1989 figures reveal no change in the top four (tuna, shrimp, cod, Alaska pollock), but catfish has jumped from seventh place to fifth place, clams occupy sixth place, flounder/sole seventh, salmon eighth, scallops ninth, and crabmeat tenth place.

Also of some interest in the "rating" of seafood preferences is the list compiled through the Food Marketing Institute's annual survey. The 1989 survey of more than 2,000 retailers in the U.S. and Canada revealed (as reported in *Frozen Food Age*, June 1990) that the most popular seafoods were shrimp (61.1 per cent), salmon (26.3 per cent), catfish (18.3 per cent), and orange roughy (16.0 per cent).

[2]According to conversations with processors.

[3]According to fact sheets put out by The Catfish Institute and research obtained from Delta Pride Catfish Company.

[4]Conversations with Delta Pride Catfish Company.

[5]Fact sheet from The Catfish Institute.

[6]Farm Fresh Catfish and The Aqua Group are two examples.

[7]An example of a current monthly report is contained in Appendix B.

[8]According to information received in conversation with Delta Pride CEO, Sam Hinote.

[9]According to conversations with company officials.

[10]According to conversations with company officials.

[11]According to conversations with company officials.

[12]Additional statistical information appears in Appendix C.

[13]The Catfish Institute: 1990 Marketing Plan, prepared by The Richards Group (Dallas, Texas), March 15, 1990.

[14]The benefits of brand-name identification have been thoroughly explored in a number of marketing publications. On branding seafood, see "Cashing in on Poultry's Success: Brand-Name Advertising Pays Off," by Nancy Hasselback, *Seafood Business*, Summer 1983, and "Brand Name Promotions," by Jane Barnett, *Seafood Business*, March/April, 1988.

[15]According to "Canadian Fisheries Landings, December 1989," Vol. 11, No. 12. Published by the Department of Fisheries and Oceans.

APPENDIX A:

LIST OF LARGER FARM-RAISED CATFISH PROCESSORS

Delta Pride Catfish
P.O. Box 850
Indianola, Mississipi 38751
(601) 887-5401
CEO: Sam Hinote

Country Skillet Catfish Company
P.O. Box 271
Isola, Mississippi 38754
(601) 962-3101
CEO: Dick Stevens

Farm Fresh Catfish Company
P.O. Box 85
Hollandale, Mississippi 38748
(601) 827-2204
CEO: Don Haynie

Southern Pride Catfish
P.O. Box 436
Greensboro, Alabama 36744
(205) 624-4021
CEO: Randy Rhodes

The Aqua Group
Clearwater, Florida
(813) 725-1643
CEO: Floyd Smiley

The Catfish Institute
P.O. Box 247
118 Hayden Street
Belzoni, Mississippi 39038
(601) 247-4913
Executive Director: Bill Allen, Jr.

APPENDIX B:
SAMPLE OF USDA CATFISH REPORTING FORM

Catfish

CANADIAN ASSOCIATION OF FISH EXPORTERS
JUN 19 1990

National Agricultural Statistics Service
Fact Finding for Agriculture Since 1863

United States Department of Agriculture
Agricultural Statistics Board
Washington, D.C.

RELEASED: May 21, 1990
3:00 P.M. ET

CATFISH PROCESSING UP 13 PERCENT

Farm-raised catfish processed during April totaled 31.0 million pounds round weight, up 13 percent from April 1989, according to the Agricultural Statistics Board.

The April average price paid to growers was 79 cents per pound, 3 cents above the same month last year.

Net pounds of processed fish sold during April totaled 15.4 million pounds, 6 percent above the comparable month in 1989. Sales of whole fish represented 33 percent of the total and fillets accounted for 47 percent. The remaining 20 percent were mostly steaks, nuggets, and value added products. Ice pack sales were 46 percent of the total amount sold.

The April average prices received by processors for whole fish were $1.65 per pound for ice pack and $1.78 for frozen fish.

Freshwater catfish imports during March totaled 322 thousand pounds, 68 percent of which were from Brazil. Imports were significantly below amount imported a year earlier. Import data were compiled by the U.S. Bureau of the Census.

Processing data were compiled in cooperation with the following processors:

America's Catch
Amite River Industries
Aquaculture Products
Blue Waters Catfish
Blue Ridge Fisheries
Carolina Classics Catfish, Inc.
Cole Foods, Inc.
Corbin Fish Farm
Country Fresh Catch
Country Skillet (Con Agra)
Delta Pride Catfish, Inc.
Dillons Fresh Catfish
Dorey Fish Co.
Farm Fresh Catfish Co.
Franklin Catfish
Freshwater Farms, Inc.
Fish Breeders of Idaho
Guidry Catfish Processors, Inc.
Gulf South Processors, Inc.
King Kat, Inc.
Kueter's Lake
Lake's Farm Raised Catfish, Inc.
La Louision
Limestone Fish Processors
Louisiana Catfish, Inc.
Low Country Aquaculture
NAIAD Inc.
Pisces
Pond Fresh
Pride of the Pond
Prime Line Catfish Co.
Red-Ark (Aqua Farms)
Simmons Farm-Raised
Southfresh Farms
Southern Pride
U. S. Fish Corp.

For Information Call: (202) 447-2123

FARM - RAISED CATFISH, 1989-90
QUANTITY PROCESSED AND PRICES PAID TO PRODUCERS, REPORTED BY MAJOR PROCESSORS; AND U.S. IMPORTS

MONTH	ROUND WEIGHT PROCESSED				AVERAGE PRICE PAID TO PRODUCERS 1/		IMPORTS OF CATFISH 2/	
	MONTHLY		CUMULATIVE					
	1989	1990	1989	1990	1989	1990	1989	1990
	THOUSAND POUNDS				DOLLARS PER POUND		(000) POUNDS	
JAN	26,948	33,066	26,948	33,066	.78	.73	588	115
FEB	28,559	31,884	55,507	64,950	.78	.75	117	553
MAR	29,458	33,120	84,965	98,070	.77	.78	795	322
APR	27,310	30,980	112,275	129,050	.76	.79	417	
MAY	28,892		141,167		.76		952	
JUN	27,598		168,765		.75		584	
JUL	27,827		196,592		.71		689	
AUG	28,371		224,963		.68		422	
SEP	30,366		255,329		.65		756	
OCT	31,670		286,999		.64		414	
NOV	29,096		316,095		.64		66	
DEC	25,805		341,900		.68		1,024	

CATFISH PROCESSORS' SALES VOLUME, AVERAGE PRICE, AND ENDING INVENTORY, APRIL

ITEM	WHOLE FISH 3/		FILLETS 4/		OTHER 5/		TOTAL	
YEAR	1989	1990	1989	1990	1989	1990	1989	1990
FRESH								
QUANTITY (000) LB	3,609	3,425	2,587	3,052	617	683	6,813	7,160
PRICE ($ / LB)	1.59	1.65	2.72	2.79	1.77	2.04	2.04	2.17
INVENTORY(000) LB	319	405	222	228	68	89	609	722
FROZEN								
QUANTITY(000) LB	1,631	1,624	4,101	4,176	2,070	2,484	7,802	8,284
PRICE ($ / LB)	1.72	1.78	2.68	2.77	2.05	2.16	2.32	2.39
INVENTORY(000) LB	1,759	3,046	3,386	3,181	1,482	2,506	6,627	8,733

1/ PRICES PAID TO PRODUCERS FOR FISH DELIVERED TO PROCESSING PLANT. 2/ DATA FURNISHED BY U.S. BUREAU OF CENSUS. 3/ DRESSED WEIGHT, (HEAD, VISERA, AND SKIN REMOVED). 4/ INCLUDES REGULAR, SHANK, AND STRIP FILLETS; EXCLUDES ANY BREADED PRODUCT. 5/ INCLUDES ALL PRODUCTS NOT ALREADY REPORTED, INCLUDING WEIGHT OF BREADING AND ADDED INGREDIENTS.

NOTICE

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The next issue of this report will be published **JUNE 21, 1990.**

*U.S.GOVERNMENT PRINTING OFFICE:1990-241-409:20180/NASS

APPENDIX C:

USDA-COMPILED STATISTICS ON FARM-RAISED CATFISH

CATFISH: ROUND WEIGHT PROCESSED, 1970-CURRENT

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
						THOUSAND POUNDS							
1970	689	1,092	520	177	97	149	221	241	348	723	715	769	5,741
1971	926	1,154	1,386	897	487	556	716	918	1,008	1,106	1,097	1,006	11,257
1972	1,320	1,520	2,134	1,487	1,531	1,365	1,180	1,638	1,483	1,673	1,781	1,221	18,333
1973	2,128	2,257	2,244	1,388	1,259	1,324	1,646	1,773	1,642	1,690	1,249	1,129	19,729
1974	1,267	1,418	1,734	1,355	1,395	1,436	1,304	1,541	1,277	1,530	1,324	1,364	16,945
1975	1,664	1,729	1,504	1,011	790	1,481	1,426	1,369	1,339	1,402	1,100	1,325	16,140
1976	1,785	1,711	2,094	1,397	1,037	1,471	1,458	1,763	1,904	1,545	1,500	1,312	18,977
1977	1,344	2,278	1,901	1,749	1,810	1,901	1,965	2,192	1,986	1,766	1,661	1,573	22,126
1978	1,598	2,361	2,951	2,510	2,729	2,189	2,310	3,186	2,607	2,647	2,935	2,154	30,177
1979	3,032	3,929	4,010	3,025	3,716	3,081	3,138	3,978	3,417	3,531	3,000	2,779	40,636
1980	3,530	4,892	4,060	3,829	4,045	3,596	3,092	4,116	3,817	4,310	3,631	3,546	46,464
1981	3,836	4,844	4,490	6,057	5,385	4,356	5,379	5,176	5,711	5,154	4,757	5,495	60,640
1982	5,448	7,848	8,845	7,937	7,974	8,156	7,269	8,398	9,883	9,209	8,609	9,829	99,405
1983	8,713	11,972	13,104	12,518	11,615	12,068	10,347	11,998	11,250	11,138	11,754	10,773	137,250
1984	13,265	14,585	14,658	13,349	12,856	11,130	12,181	13,379	12,520	12,588	12,527	11,217	154,255
1985	13,429	17,166	18,290	16,474	17,432	15,897	14,311	17,130	16,638	16,861	14,625	13,363	191,616
1986	19,761	19,083	18,664	16,354	16,013	15,951	17,036	18,663	18,859	20,453	17,107	15,812	213,756
1987	20,988	22,163	27,583	26,781	21,623	19,581	21,638	24,403	26,577	27,920	20,684	20,555	280,496
1988	26,018	27,786	28,179	20,805	20,351	22,839	23,687	26,941	24,611	26,221	25,037	22,634	295,109
1989	26,948	28,559	29,458	27,310	28,892	27,598	27,827	28,371	30,366	31,670	29,096	25,805	~~26,948~~ 341,900

CF2 PRINT RANGE (A62..N93)

CATFISH SOLD BY PROCESSORS, 1970-CURRENT TOTAL

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
						THOUSAND POUNDS							
1970	N/A	373.1	145.3	202.4	181.7	353.3	216.6	190.8	257.5	291.1	282.8	293.7	278[illegible].3
1971	596.3	884.4	750.3	959.7	467.8	455.9	427.2	436.6	571.4	494.8	630.2	544.9	721[illegible].5
1972	682.3	936.7	1385.5	852.8	976.8	879.3	797	1058.6	953	991	881.1	680.5	1107[illegible].6
1973	1450.5	1446.1	1518.8	979.3	835.1	755.8	916.7	726.4	887.4	1012.5	806.4	609.3	1194[illegible].3
1974	805.5	935.9	1014.6	983.5	870.7	934.8	958.9	1054.9	787.3	967.3	767.1	826.5	10[illegible]07
1975	1060.8	1227.1	1209.7	840	553.7	794.1	793.5	771.7	796.7	800.9	700.3	768.6	1031[illegible].1
1976	990.2	984.8	1320.1	922.3	722	982.2	912.5	1087.7	1138.8	986	877.4	813.8	1173[illegible].8
1977	966.6	1369.1	1290	1115.6	1081.7	1077.9	1098.8	1328.3	1150.8	1025.8	965.2	778	1324[illegible].8
1978	1048.1	1472.5	1831.4	1527.6	1741.9	1330.5	1471.4	2003.4	1550.2	1617.8	1739	1179.4	1851[illegible].2
1979	1828.8	2443.2	2529.8	1943.1	2319.2	1731.2	1839.1	2320.5	2029.8	2058.3	1684.4	1602.3	2432[illegible].7
1980	2,198	2,814	2,535	2,507	2,487	2,089	2,250	2,324	2,183	2,363	2,226	1,781	27,757
1981	2,269	2,738	3,127	3,348	2,955	2,419	3,015	3,209	3,205	3,030	2,782	3,040	35,137
1982	3,340	4,726	5,461	4,891	4,787	4,949	4,401	5,029	5,545	5,102	4,496	5,232	57,959
1983	5,101	6,885	7,248	6,093	6,278	6,178	5,639	6,630	5,908	5,896	5,923	5,684	73,463
1984	6,698	8,021	8,001	7,121	6,750	6,050	6,619	7,372	6,787	6,644	6,498	5,402	81,963
1985	7,230	8,962	9,278	8,833	8,729	8,307	7,883	9,782	8,332	8,312	7,231	6,401	99,280
1986	9,034	9,596	10,558	9,002	9,239	8,951	9,668	10,188	9,896	10,649	8,917	8,196	113,894
1987	10,767	12,220	14,463	12,944	11,001	11,000	11,876	13,021	13,494	14,041	11,312	10,362	146,501
1988	12,533	14,313	14,676	12,253	11,840	12,018	11,819	12,453	12,309	13,005	11,815	10,496	149,530
1989	13,996												~~13,996~~ 174,100

F6 PRINT RANGE (A222..N253)

PRICES PAID TO PRODUCERS FOR FARM-RAISED CATFISH, 1970-CURRENT

EAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN AVG
						CENTS PER POUND							
1970	35.5	34.6	34.7	35.5	37.6	36.7	35.4	35.8	34	32.3	31.2	31.1	33.8
1971	30.4	30.1	31.7	32.9	33.2	34.6	33.6	33.3	33.2	32.7	32.7	33.1	32.4
1972	32.2	32.1	33.1	33.1	34.2	34.5	34.1	34.3	33.2	32.6	32.6	33.3	33.2
1973	33.9	35.6	40.6	45	48.3	48.6	49.6	49.8	49.5	47.7	46.5	46.4	44.3
1974	46.4	46.4	45.9	46.6	46.5	46.3	45.9	45.2	45.2	45.5	45.6	46	45.9
1975	45.8	46.5	46.3	48.5	51.6	52	51.7	51.9	51.6	48.6	48.1	48.2	49.1
1976	48.7	48.7	49.3	51.3	54.5	55.1	55.7	55.5	55.8	54.1	52.9	52.7	52.7
1977	52.9	55.5	59.6	60.9	60.7	61	61.1	58	56.4	56.6	56.2	56.1	58
1978	56.1	56	56.1	55.8	55.6	55.8	55.9	55.7	53.3	51.6	51.3	51.6	54.5
1979	52.3	55	58.5	60	60.4	62.8	64.9	64.8	64.6	64.7	64.9	64.8	61.4
1980	65	69	69	69	69	68	69	68	67	66	67	65	67.6
1981	64	64	67	69	70	69	65	63	60	60	58	56	62.7
1982	57	59	57	54	53	53	53	53	54	55	56	56	56.9
1983	56	55	56	59	62	65	65	65	64	63	62	61	61.1
1984	61	66	72	74	73	74	74	72	69	67	65	65	69.2
1985	67	69	73	78	77	77	76	72	71	70	70	70	72.6
1986	70	70	72	74	72	68	66	63	63	62	61	61	66.8
1987	60	57	59	65	69	64	61	60	60	61	62	64	61.7
1988	68	72	75	75	75	78	80	80	79	79	78	78	76.4
1989	78	78	77	76	76	75	71	68	65	64	64	68	71.5

CF7 PRINT RANGE (A262..N293)

CATFISH: IMPORTS OF CATFISH, 1970-CURRENT

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
						THOUSAND POUNDS							
1970	420.0	341.0	413.0	277.0	584.0	208.0	475.0	423.0	358.0	437.0	644.0	221.0	4,801.0
1971	377.8	84.9	190.3	58.1	184.2	122.9	209.4	338.1	321.3	120.6	264.2	932.1	3,203.9
1972	231.8	743.6	289.9	349.1	216.1	256.7	357.6	677.9	361.4	502.6	449.7	369.8	4,806.2
1973	542.5	307.0	632.1	737.4	434.2	522.6	335.1	472.8	593.2	1,067.9	395.7	572.2	6,612.7
1974	947.4	289.6	453.9	669.8	560.7	1,670.6	486.2	794.8	186.6	937.3	789.3	657.2	8,443.4
1975	1,495.6	641.2	663.0	1,421.1	749.1	782.5	996.5	1,089.6	331.9	978.5	606.5	1,150.7	10,906.2
1976	661.2	398.4	1,313.0	778.1	1,168.7	595.3	270.8	1,137.1	935.6	812.4	1,092.3	1,048.7	10,211.6
1977	796.6	2,626.0	1,318.8	1,750.8	1,715.7	1,380.3	1,205.7	1,471.6	1,253.7	1,594.2	1,193.8	1,676.2	17,983.4
1978	1,845.0	752.1	1,936.0	2,188.1	2,533.7	1,045.5	862.9	968.1	1,524.2	814.8	2,728.4	1,173.1	18,371.9
1979	995.3	1,683.4	638.6	2,521.9	2,013.7	945.7	2,272.6	759.3	889.2	1,298.2	1,361.0	1,610.4	16,989.3
1980	1,308.5	1,511.1	1,170.0	1,045.3	1,108.4	2,224.7	1,109.9	2,429.6	1,424.5	283.7	863.2	443.4	14,922.3
1981	1,003.3	1,119.4	1,044.1	1,433.7	981.8	521.3	629.5	1,011.1	569.5	597.0	470.9	239.4	9,621.0
1982	564	377	474	231	744	492	499	542	906	569	348	148	5,894
1983	434	210	283	375	283	101	445	434	468	631	523	87	4,274
1984	401	479	661	861	436	656	384	515	54	599	696	422	6,164
1985	589	425	976	602	214	928	871	423	832	96	603	501	7,060
1986	383	947	610	954	646	787	543	669	486	800	1,142	199	8,166
1987	583	1,241	256	1,012	688	301	624	570	622	642	76	464	7,079
1988	451	508	577	217	1,015	26	724	414	669	674	388	182	5,845
1989	528	117	795	417	952	584	689	422	756	414	66	1,020	6,820

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FOR FURTHER READING AND REFERENCE:

The following regularly present information on the farm-raised catfish industry:

Aquaculture Magazine, published monthly

Aquaculture Digest, published monthly; Contact Bob Rosenberry, Editor, 9434 Kearny Mesa Road, San Diego, CA 92126 USA.

The Catfish Journal, published monthly by the Catfish Farmers of America; Contact Mike McCall, Editor, P.O. Box 34, 550 High Street, Suite 1602, Jackson, MS 39205 USA.

The Catfish News, published monthly; Contact Kevin Jones, Editor, P.O. Box 4566, Jackson, MS 39216 USA.

Seafood Business, published bi-monthly; Contact Nancy Hasselback, Publisher, P.O. Box 908, Rockland, ME 04841 USA.

Seafood Leader, published bi-monthly; Contact Peter Redmayne, Editor, 1115 N.W. 46th Street, Seattle, WA 98107 USA.

Seafood International, published monthly; Contact Mike Urch, Editor, AGB Heighway Ltd., Alexander House, 81-89 Farringdon Road, London EC1M 3LL, UK.

Water Farming Journal, published monthly; Contact Carroll Trosclair, Editor, 3400 Neyrey Dr., Metairie, LA 70002 USA.